

Solve each system using substitution.

$-5x + y = 2$   
 1)  $-2x + y = 5$   
 $5x + y = 2$   
 $5x + y = 5$   
 $-3 = -3$   
 $3x = 3$   
 $x = 1$   
 $y = 7$   
 $(1, 7)$

$4x + y = 9$   
 2)  $2y = -8x + 18$   
 $4x + y = 9$   
 $4x + y = 9$   
 $2(-4x + 9) = -8x + 18$   
 $-8x + 18 = -8x + 18$   
 $18 = 18$   
Consistent dependent

Algebra 2 5.0  
3.2 Elimination Method

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Pd: \_\_\_\_\_

You can ELIMINATE if and only if:

- 1) Opposites
- 2) Variables and equal signs are lined up

Example 1:

1)  $3x - y = 8$   
 $2x - y = 7$   
 $x = 3$   
 $2(3) - y = 7$   
 $6 - y = 7$   
 $-y = 1$   
 $y = -1$   
 $(3, -1)$

2)  $x + y = 14$   
 $x - y = 4$   
 $2x = 18$   
 $x = 9$   
 $9 + y = 14$   
 $y = 5$   
 $(9, 5)$

3)  $3x - y = 7$   
 $5x - 2y = 1$   
 $3(1) - y = 7$   
 $3 - y = 7$   
 $-y = 4$   
 $y = -4$   
 $5(1) - 2y = 1$   
 $5 - 2y = 1$   
 $-2y = -4$   
 $y = 2$   
 $(1, 2)$

Example 2:

1)  $4x + 5y = 6$   
 $4x - 2y = -8$   
 $-7y = 14$   
 $y = -2$   
 $4x + 5(-2) = 6$   
 $4x - 10 = 6$   
 $4x = 16$   
 $x = 4$   
 $(4, -2)$

2)  $3x + 2y = 2$   
 $3x + y = 7$   
 $-y = -5$   
 $y = 5$   
 $3x + 2(5) = 2$   
 $3x + 10 = 2$   
 $3x = -8$   
 $x = -\frac{8}{3}$   
 $(-\frac{8}{3}, 5)$

3)  $x - 2y = 2$   
 $3x - 2y = 10$   
 $-2x = -8$   
 $x = 4$   
 $4 - 2y = 2$   
 $-2y = -2$   
 $y = 1$   
 $(4, 1)$

4)  $2x + y = 25$   
 $2x - 5y = 7$   
 $-6y = -18$   
 $y = 3$   
 $2x + 3 = 25$   
 $2x = 22$   
 $x = 11$   
 $(11, 3)$

Independent Systems:

1)  $2x + 5y = 15$   
 $4x + 7y = -13$   
 $-11y = 30$   
 $y = -\frac{30}{11}$   
 $2x + 5(-\frac{30}{11}) = 15$   
 $2x - \frac{150}{11} = 15$   
 $2x = \frac{315}{11}$   
 $x = \frac{315}{22}$   
 $(\frac{315}{22}, -\frac{30}{11})$

2)  $6r + 7t = -15$   
 $-3r + t = -6$   
 $9r + 7t = -15$   
 $-10t = 15$   
 $t = -\frac{3}{2}$   
 $-3r - \frac{3}{2} = -6$   
 $-3r = -\frac{9}{2}$   
 $r = \frac{3}{2}$   
 $(\frac{3}{2}, -\frac{3}{2})$

3)  $2x - 7y = 3$   
 $5x - 4y = -6$   
 $-10x + 35y = 15$   
 $-10x + 8y = -12$   
 $27y = 27$   
 $y = 1$   
 $2x - 7(1) = 3$   
 $2x - 7 = 3$   
 $2x = 10$   
 $x = 5$   
 $(5, 1)$

4)  $2y - 4x = 18$   
 $-5x + 3y = 23$   
 $-4x + 2y = 18$   
 $-10x + 6y = 46$   
 $12x - 6y = -54$   
 $2x = -8$   
 $x = -4$   
 $2y - 4(-4) = 18$   
 $2y + 16 = 18$   
 $2y = 2$   
 $y = 1$   
 $(-4, 1)$

5)  $\begin{cases} 2x + 5y = 12 \\ 2x + 5y = 15 \end{cases}$

$$\begin{array}{r} -1 \times \\ \hline -2x - 5y = -15 \\ 2x + 5y = 12 \\ \hline 0 = 3 \end{array}$$

Inconsistent

6)  $\begin{cases} 8x + 4y = -16 \\ 2x + y = -4 \end{cases}$

$$\begin{array}{r} -4 \times \\ \hline -8x - 4y = 16 \\ 8x + 4y = -16 \\ \hline 0 = 0 \end{array}$$

Consistent  
Dependent

Practice:

1)  $\begin{cases} 5x + 3y = 2 \\ 2x + 20 = 4y \end{cases}$

$$\begin{array}{r} 2x = 4y - 20 \\ 5x + 3y = 2 \\ \hline 2x - 4y = -20 \\ 5x + 3y = 2 \\ \hline 6x - 10y = -60 \\ 20x + 10y = 8 \\ \hline 26x = -52 \\ x = -2 \end{array}$$

Inconsistent

2)  $\begin{cases} 2x = 5 + 4y \\ 4y = 2x + 4y \end{cases}$

$$\begin{array}{r} 2x = 5 + 4y \\ 4y = 2x + 4y \\ \hline 2x - 4y = 5 \\ -x + 2y = 8 \\ \hline -2x + 4y = 16 \\ 2x - 4y = 5 \\ \hline 0 = 21 \end{array}$$

Inconsistent

3)  $\begin{cases} 4y + 30 = 10x \\ 5x - 2y = 15 \end{cases}$

$$\begin{array}{r} 4y + 30 = 10x \\ 5x - 2y = 15 \\ \hline -10x + 4y = -30 \\ 5x - 2y = 15 \\ \hline 10x + 4y = 30 \\ 5x - 2y = 15 \\ \hline 10x + 4y = 30 \\ 5x - 2y = 15 \\ \hline 0 = 0 \end{array}$$

Consistent  
Dependent

## HW

### 3.2 Solving Systems of Equations by the Elimination Method